R. J. LAST

ANATOMY

REGIONAL AND APPLIED

SEVENTH EDITION

Churchill Livingstone

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Regional and Applied

R. J. LAST

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PREFACE TO THE SEVENTH EDITION

It is 30 years since the first edition of this book was published. The book stemmed from my experience at the Royal College of Surgeons of England. There I initiated the teaching of anatomy by intensive courses, each lasting up to four months, offered to postgraduate students for the primary examination for the Fellowship of the College. During my 24 years at the College over 12,000 students attended those courses; they came from 78 countries. Since 1970 I have continued to teach, but now my students are undergraduates (freshmen) in California. They have fulfilled the hope expressed in my first preface, namely that undergraduate students also will find the book of use, 'for the human body remains the same whoever studies it'.

Since 1970 I have not only visited the University of California, Los Angeles as Visiting Professor for five months each year but have also spent at least a further two months each year in flights around the world, with multiple stops. In this way I have visited medical centres in many countries, meeting former students from London days and many others now active in medical education. These include paramedical people, physiotherapists, podiatrists, nurses, as well as dental students and practitioners. It is very rewarding to meet them. It is their influence that is responsible for maintaining the character of my teaching, and it is a great comfort to me that the book lives on so vigorously.

The plan of the book is unaltered. I quote again from the first preface, 'I have attempted to include in the text all those parts of human anatomy which should occupy a place in the knowledge *and in the understanding* of the student or the general clinician and I have sought to exclude details that have neither practical application nor value in illustrating a general principle'. In that first preface I advised that the book be read only with the appropriate prosected parts, a museum specimen and the relevant bones close at hand. If prosected parts and a museum are not available the next best thing is a good colour atlas. I am very familiar with the specimens photographed in colour for Professor R M H McMinn in *A Colour Atlas of Human Anatomy* (1980). They are in the museum of Anatomy at the Royal College, I used them in my own teaching at the College, and many of them are illustrated in this book.

I am more than ever convinced that the most fruitful approach to the understanding of structure is its functional significance. The function or role of any formation should always be questioned even though there may not always be an answer. For example, 'why are kidneys kidney-shaped?' is a baffling question to which no answer has yet been found.

It has always been one of my aims to prevent the book from growing in size and I have achieved this. It is true that extra material has been added, especially the accounts of osteology introduced at the end of each section in the third edition. These are optional, to be read by choice or compulsion according to the requirements of your own medical institution. This seventh edition likewise contains some more pages, namely a Glossary of Names commonly used in anatomy: this is for the convenience of those, and there are many, who like to know derivations and meanings.

Finally let me quote from my first preface: 'I sincerely hope that your reading of the following pages may not only prove profitable to you but will stimulate your permanent interest in a fascinating subject, much of which is still not fully understood'.

1984 **R.J. Last**

FROM THE PREFACE TO THE THIRD EDITION

Only material that has practical application or that illustrates a general principle is considered appropriate for inclusion. Consequently a great deal of osteology already existed in the book, studied as part of the region concerned. *This osteology remains in the text as before.*

Full accounts of each bone are now included in response to innumerable requests, some amounting almost to demands, from many parts of the world.

To the student who must 'learn the bones' the following advice is offered. Never attempt to learn the whole bone until the anatomy of the 'soft parts' has been thoroughly mastered; most *practical* details of the bones will have already been noted during the study of the region. *Never read osteology unless the bone is in front of you.* Even though the bone may need reversing for inspection (e.g. base of skull), wherever possible you should study osteology with the bone *strictly in its correct anatomical position.*

ACKNOWLEDGMENTS

It is very gratifying to be able to reproduce twenty-eight of Dr. Tompsett's drawings of his own prosections in the Museum of the Royal College of Surgeons; for this privilege I thank the President of the College. I am indebted to Messrs. H. K. Lewis & Co. for their permission to reproduce Figs. 6.15, 6.55 and 6.56 from *The Anatomy of the Eye and Orbit*. Fig. 6.54 is adapted, by permission of Messrs. John Wright & Sons, from French's *Differential Diagnosis of Main Symptoms*. I am grateful to the proprietors of the *Journal of Bone and Joint Surgery* for permission to reproduce from my articles Figs. 1.29, 2.44, 3.18, 3.49, 3.55, 6.76 and 6.77 and to the proprietors of the *British Journal of Surgery* for permission to reproduce Figs. 7.10 to 7.14 inclusive and Fig. 7.40.

I am indebted to Miss J. Fairfax Whiteside for the care and skill with which she has drawn Figs. 1.4, 3.15, 4.26, 5.47, 5.54, 6.11 and 6.30 and Plates 4 and 37. I thank Dr. Seymour J. Reynolds for the X-ray films from which Figs. 4.6, 4.7, 5.31 and 6.69 have been made. Dr. Lloyd Morris supplied the arthrogram for Fig. 3.31 and Dr. Bryan J. Trenwith produced the transparency for Fig. 6.47. I thank Mr. Frederic Mancini for modelling the face and ear on the skull photographed in Fig. 6.13. Dr. Douglas Silva kindly provided the photomicrographs for Fig. 1.23, and Dr. Frances S. Grover supplied the information from which Fig. 3.65 was drawn.

Finally it is with much gratitude that I acknowledge the biographical notes that continue to be provided by Miss Jessie Dobson, who is now a Hunterian Trustee at the Royal College of Surgeons of England.

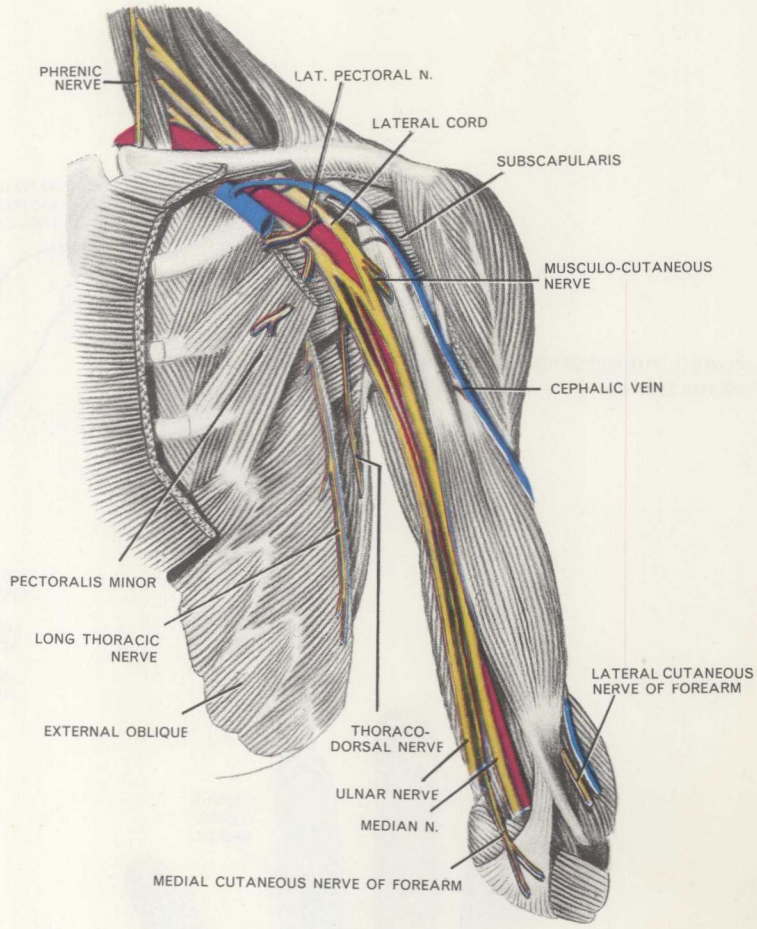


PLATE 1. THE LEFT AXILLA AND ARM.

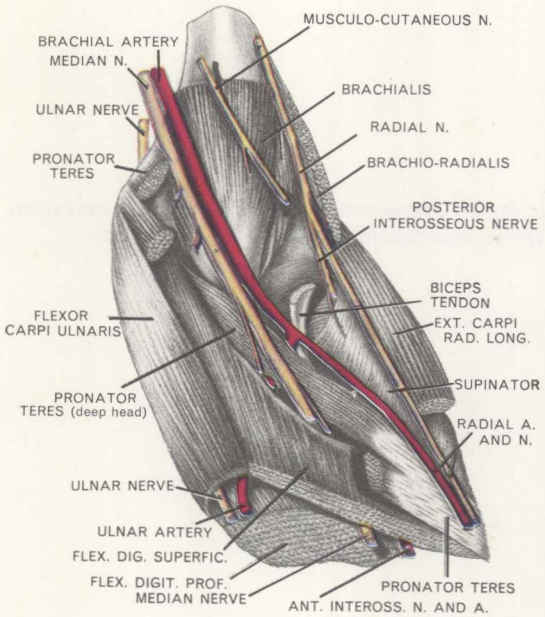
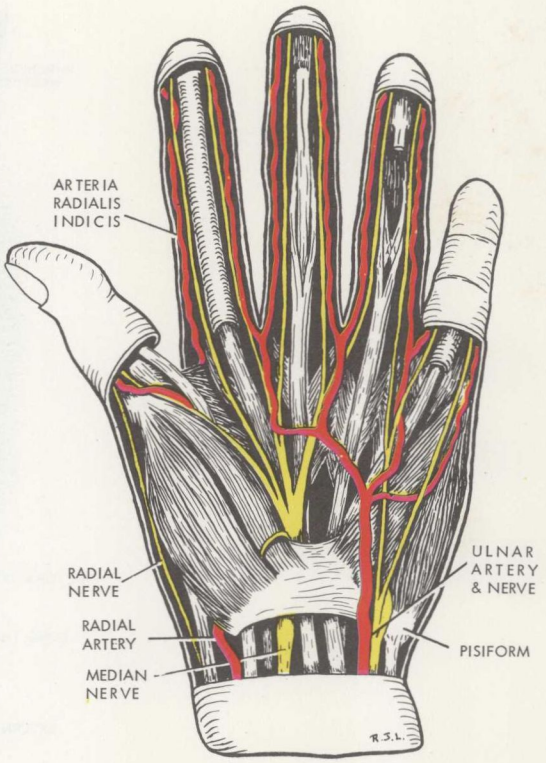


PLATE 2. THE FLOOR OF THE LEFT CUBITAL FOSSA.

PLATE 3. THE SUPERFICIAL PALMAR ARCH AND DIGITAL NERVES OF THE LEFT HAND.



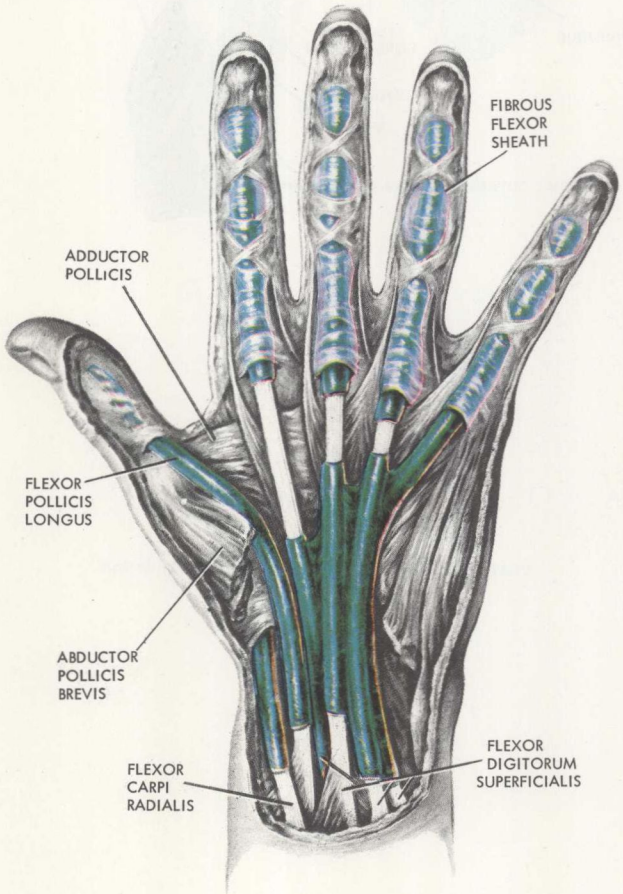


PLATE 4. THE SYNOVIAL FLEXOR SHEATHS OF THE LEFT HAND.
Drawn from Specimen S.51 in R.C.S. Museum.

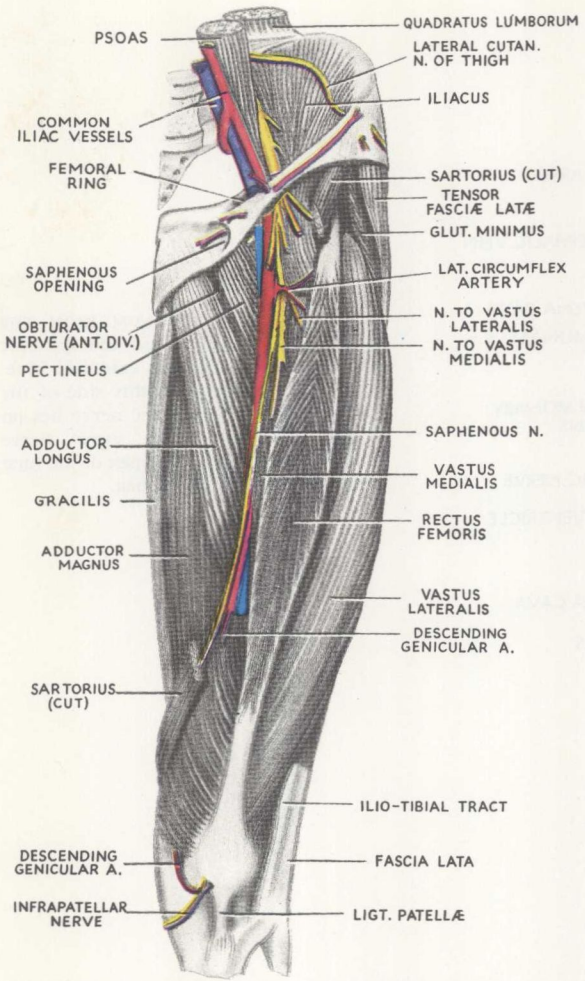


PLATE 5. THE LEFT THIGH, WITH THE SUBSARTORIAL CANAL EXPOSED.

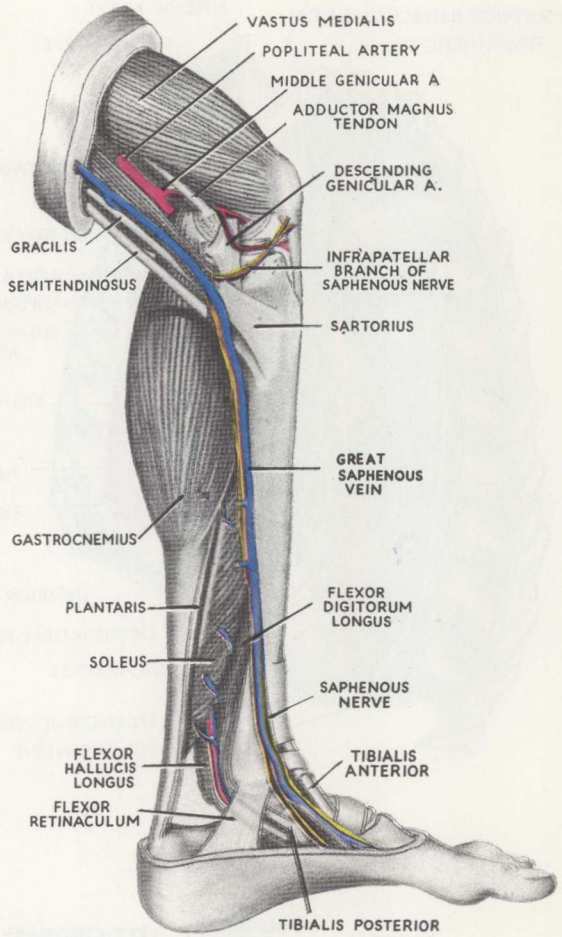


PLATE 6. THE MEDIAL SIDE OF THE LEFT LEG.

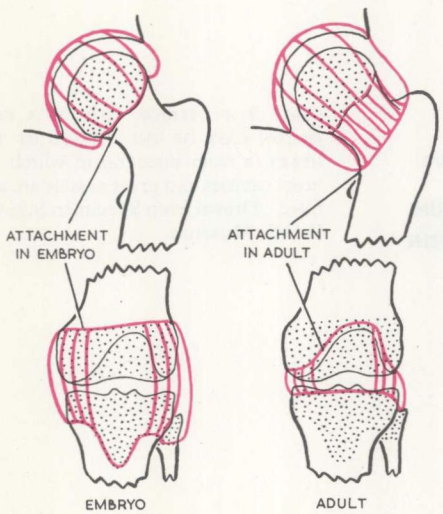


PLATE 7. THE MIGRATION OF JOINT CAPSULES FROM THE EPIPHYSEAL LINE. The epiphysis of the head of the femur becomes intracapsular, the lower epiphysis of the femur becomes extracapsular. There are many such examples.

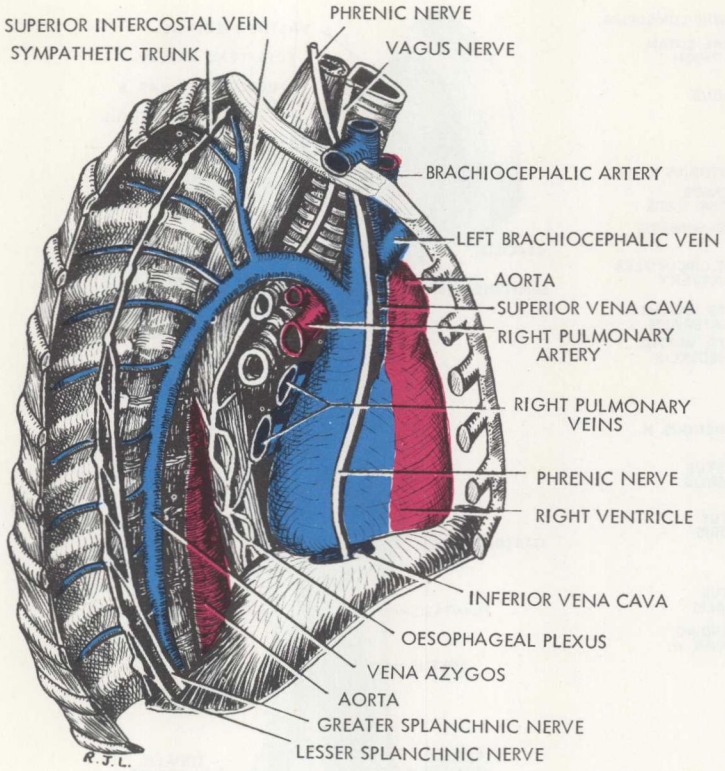


PLATE 8. THE MEDIASTINUM FROM THE RIGHT SIDE. The atria and the systemic *and pulmonary* veins are coloured blue. They are prominent on this side of the mediastinum. The phrenic nerve lies on venous structures. The vagus nerve touches the trachea. The apex of the lung is in contact with the trachea.

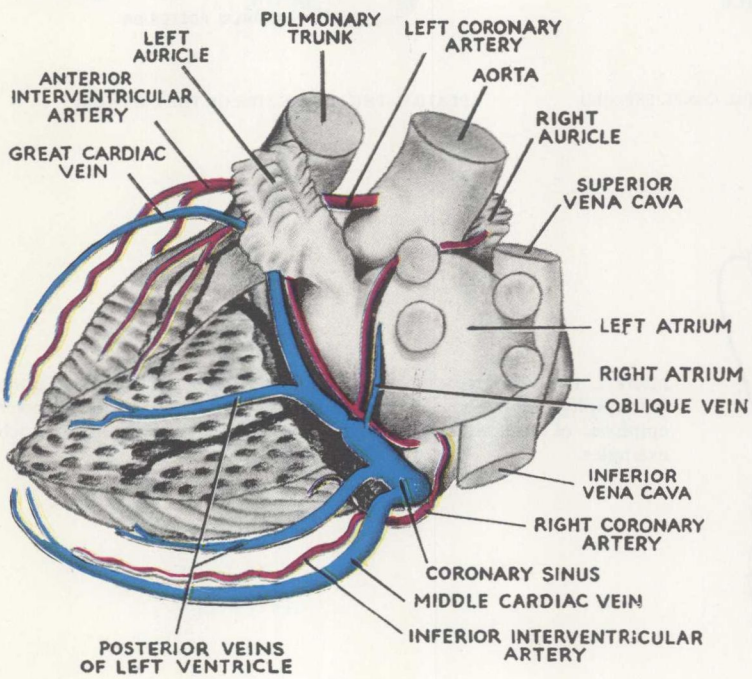


PLATE 9. POSTERIOR VIEW OF A CORROSION CAST OF THE VESSELS OF THE HEART (a resin injection in which the heart cavities and great vessels are also filled). Drawn from Specimen S.264 in R.C.S. Museum.

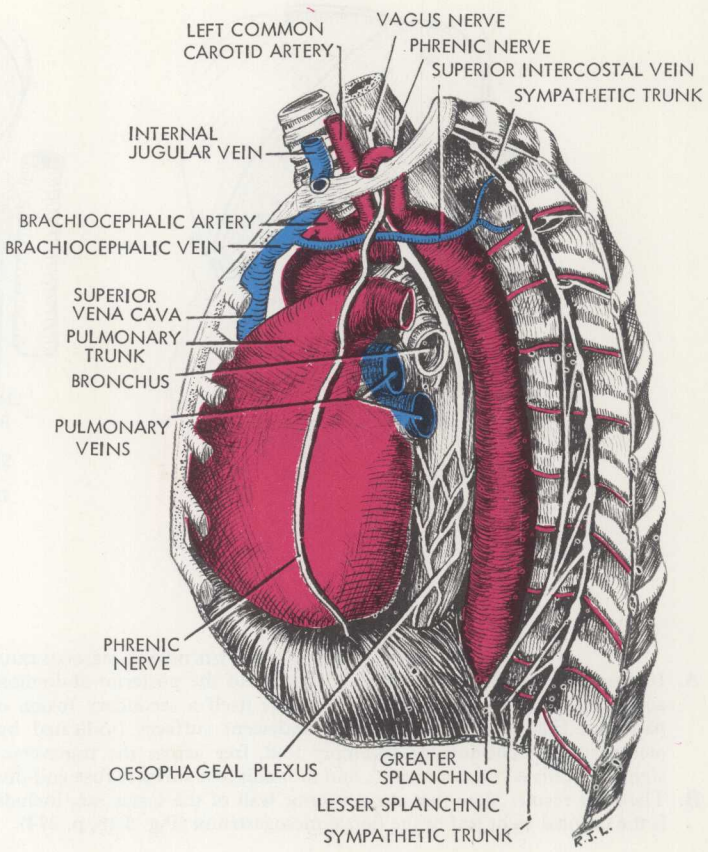


PLATE 10. THE MEDIASTINUM FROM THE LEFT SIDE. The ventricles and the systemic *and pulmonary* arteries are coloured red. They are prominent on this side of the mediastinum. The phrenic nerve lies on arterial structures. The vagus nerve and the apex of the lung are held away from the trachea by the arch of the aorta and its branches.

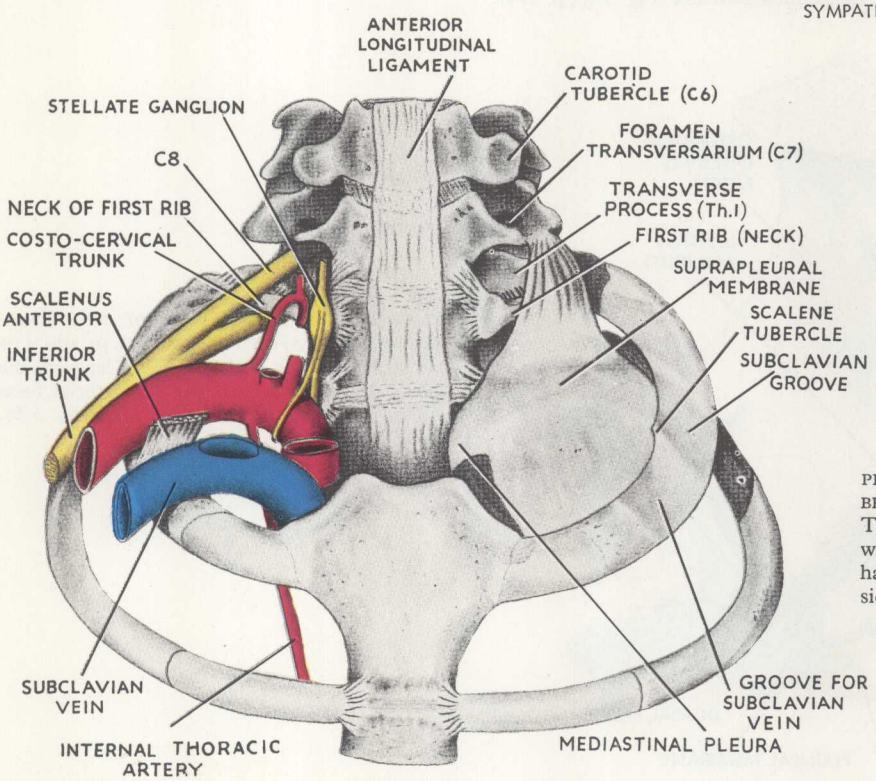


PLATE 11. THE SUPRAPLEURAL MEMBRANE AND THE THORACIC INLET. The suprapleural membrane (on which the subclavian vessels lie) has been removed from the right side. Drawn from a dissection.

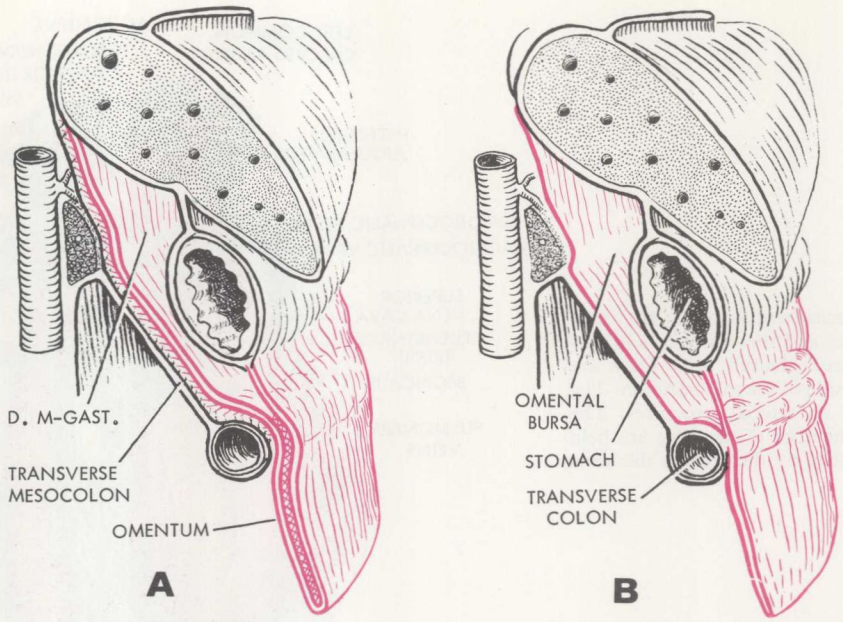


PLATE 12. THE FATE OF THE DORSAL MESOGASTRIUM, HERE SHOWN IN RED.

A. It sweeps to the left across the peritoneum of the posterior abdominal wall (D. M-GAST) as in Fig. 5.23, p. 278 and across the transverse mesocolon (which is itself a secondary fusion of midgut mesentery to the peritoneum across the pancreas, Figs. 5.20, 5.21, p. 277). Adjacent surfaces (indicated by cross-hatching) fuse and disappear. The dorsal mesogastrium continues as an empty fold, free across the transverse colon and slung to the greater curvature of the stomach. This is 'the omentum', and in it adjacent surfaces fuse and disappear (see cross-hatching).

B. The final result. Note that the posterior wall of the lesser sac, including the anterior layer of the transverse mesocolon, is the original right leaf of the dorsal mesogastrium (Fig. 5.18, p. 274).

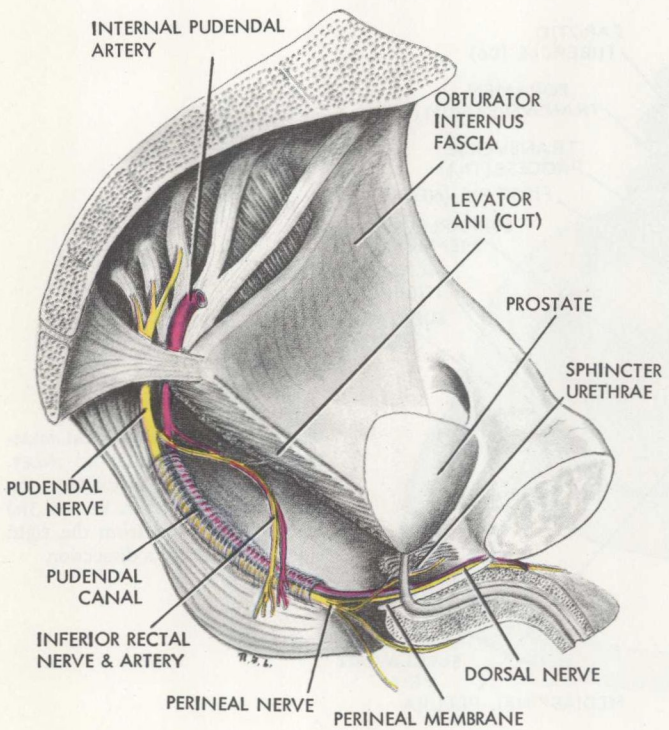


PLATE 13. THE LATERAL WALL OF THE ISCHIO-RECTAL FOSSA, EXPOSED BY REMOVAL OF MUCH OF LEVATOR ANI. The pudendal canal leads to the perineal membrane, and the ischio-rectal fossa extends forward deep to this (cf. Fig. 5.56, p. 323).

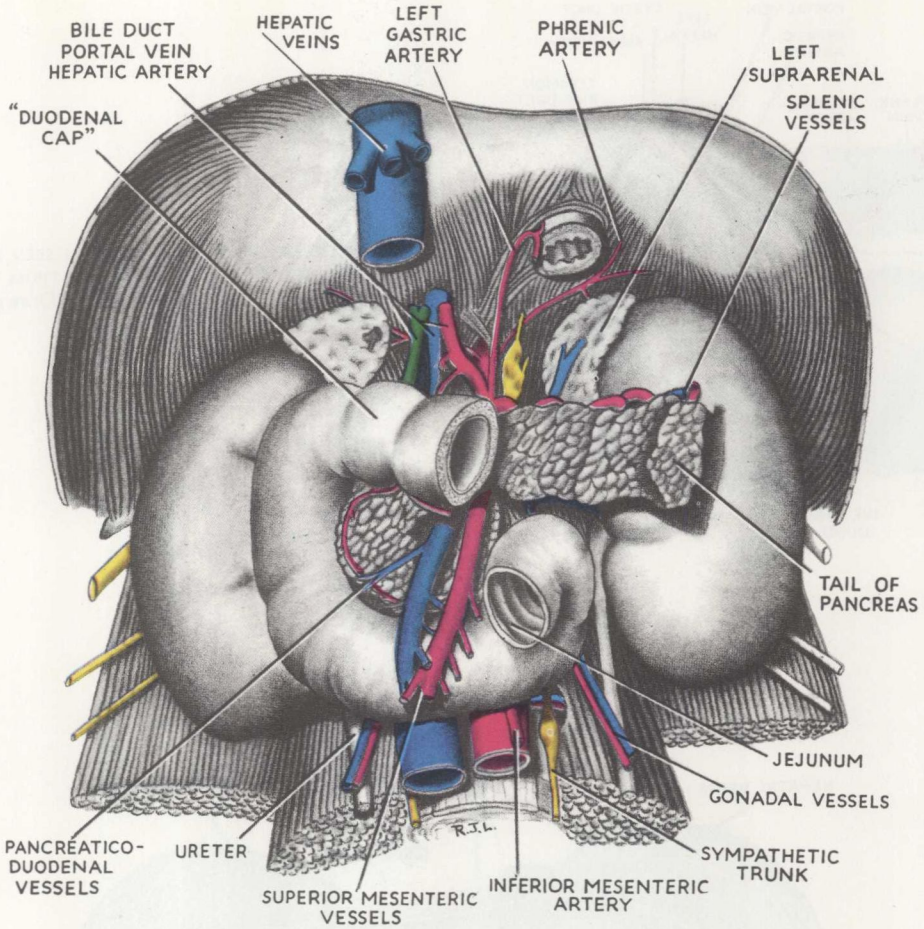


PLATE 14. THE DUODENUM AND PANCREAS IN POSITION ON THE POSTERIOR ABDOMINAL WALL.

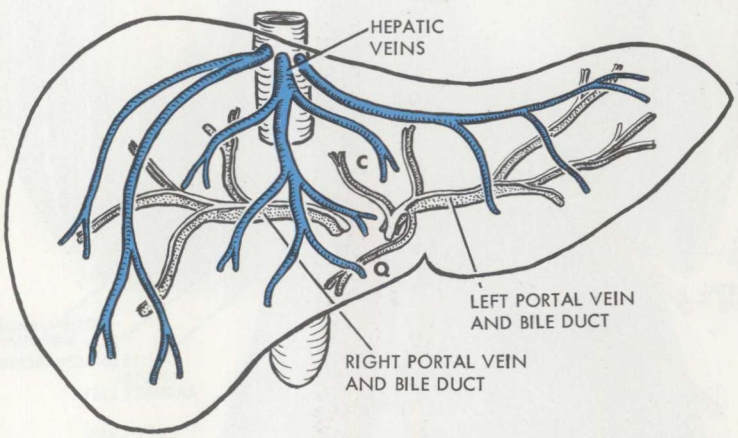


PLATE 15. THE VESSELS OF THE LIVER. The right and left **portal veins** enter the visceral surface and supply equal *halves* of the liver. The **bile ducts** always cross in front of the portal veins. The **hepatic artery** (not shown) is generally between the two; the order is V.A.D. even within the liver itself. The caudate (**C**) and quadrate (**Q**) lobes are supplied from the left side and drain into the middle hepatic vein. The three main **hepatic veins** lie high up near the diaphragmatic surface of the liver. Small accessory hepatic veins reaching the inferior vena cava at a lower level are not shown. Drawn from corrosion casts in R.C.S. Museum.

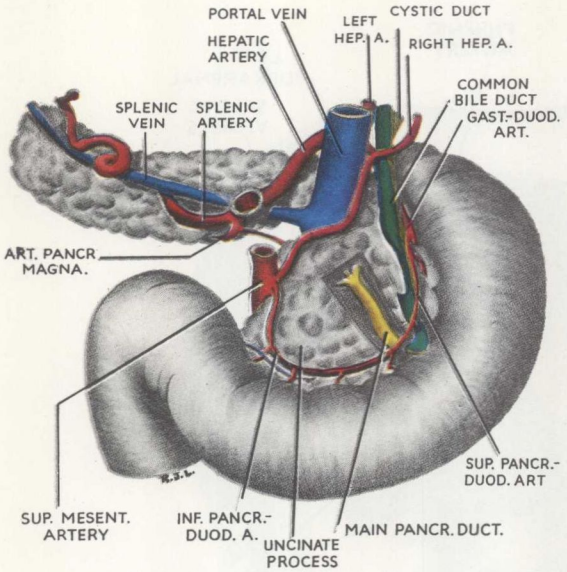


PLATE 16. THE PANCREAS AND DUODENUM SEEN FROM BEHIND. HERE THE RIGHT HEPATIC ARTERY ARISES FROM THE SUPERIOR MESENTERIC ARTERY, A COMMON VARIANT. Drawn from Specimen S.277 in R.C.S. Museum.

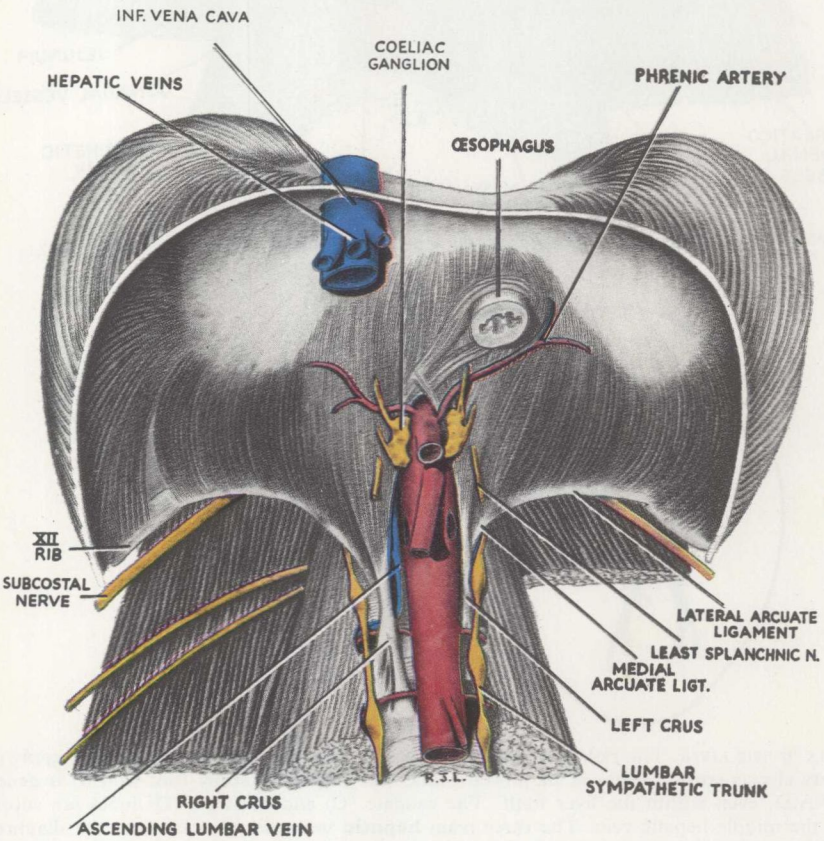


PLATE 17. THE CRURA AND POSTERIOR ATTACHMENTS OF THE DIAPHRAGM.

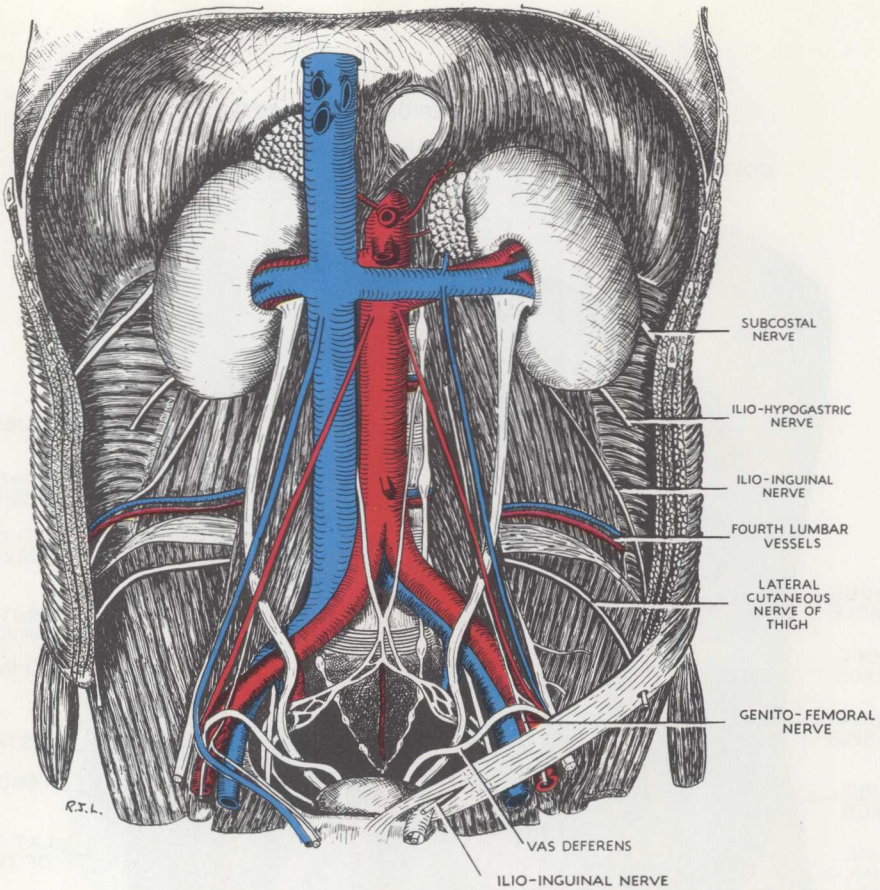


PLATE 18. THE POSTERIOR ABDOMINAL WALL. Sketched from a dissection.

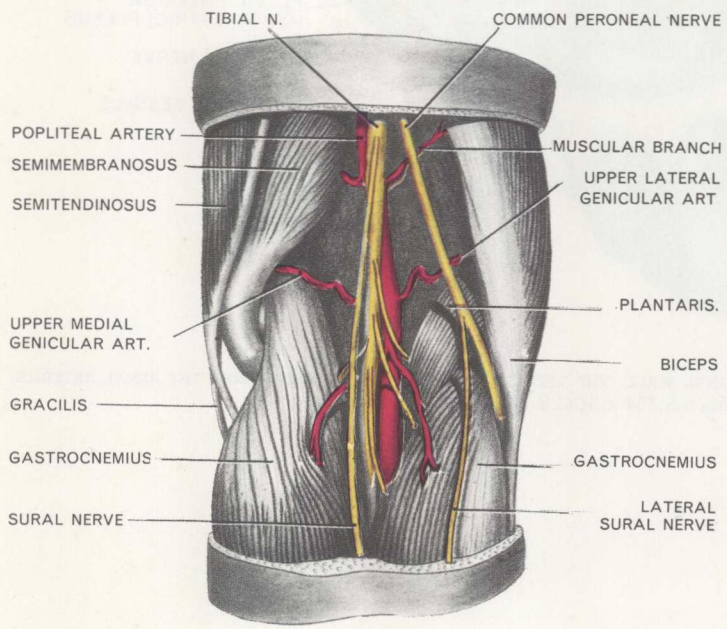


PLATE 19. THE RIGHT POPLITEAL FOSSA, THE SIDE IDENTIFIED BY THE COMMON PERONEAL NERVE. Drawn from Specimen S.133 in R.C.S. Museum.

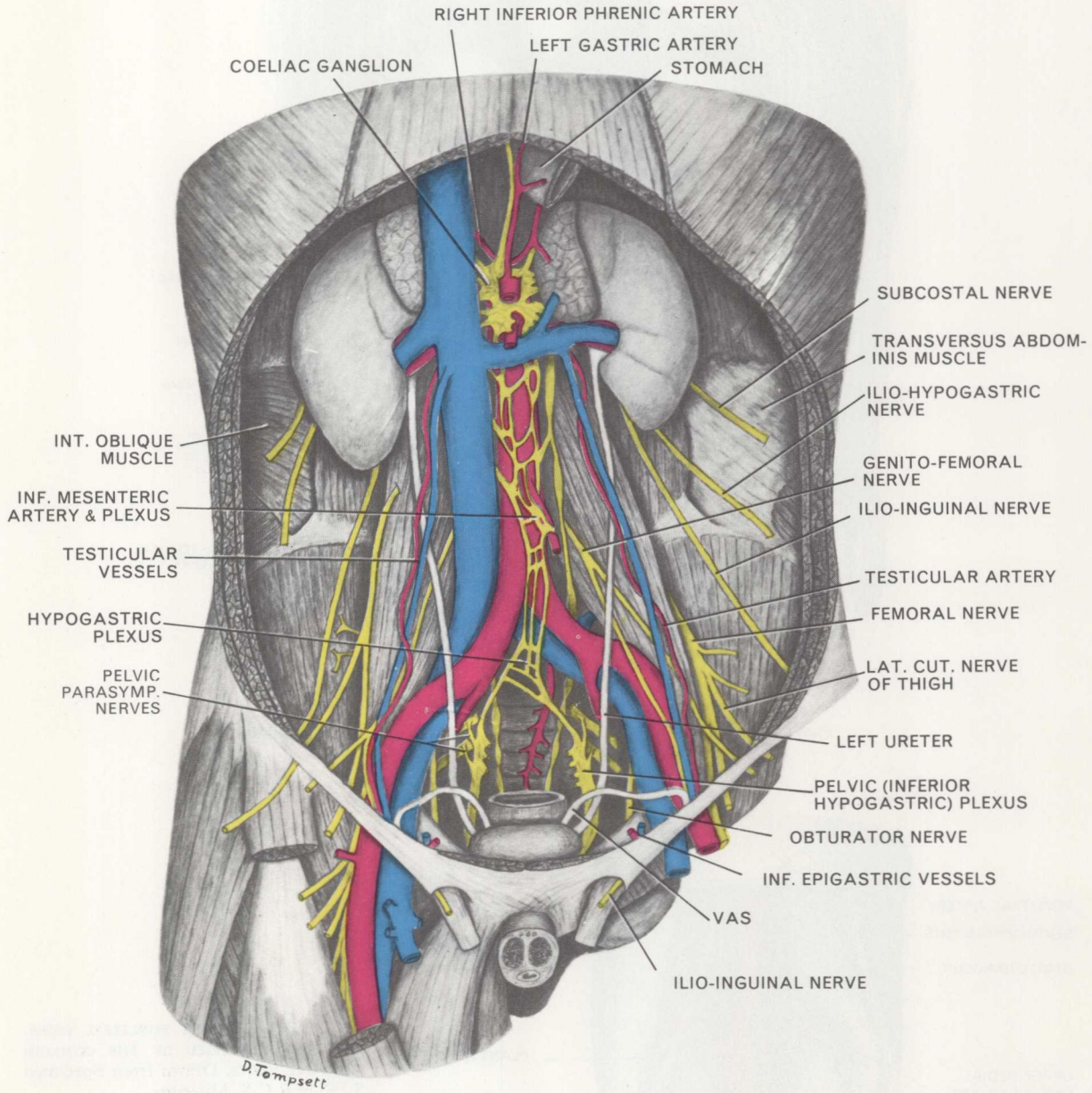


PLATE 20. A DISSECTION OF THE POSTERIOR ABDOMINAL WALL. THE TESTICULAR ARTERIES HERE ARISE FROM THE RENAL ARTERIES, A NOT UNCOMMON VARIATION. Illustration of Specimen S.354 in R.C.S. Museum.

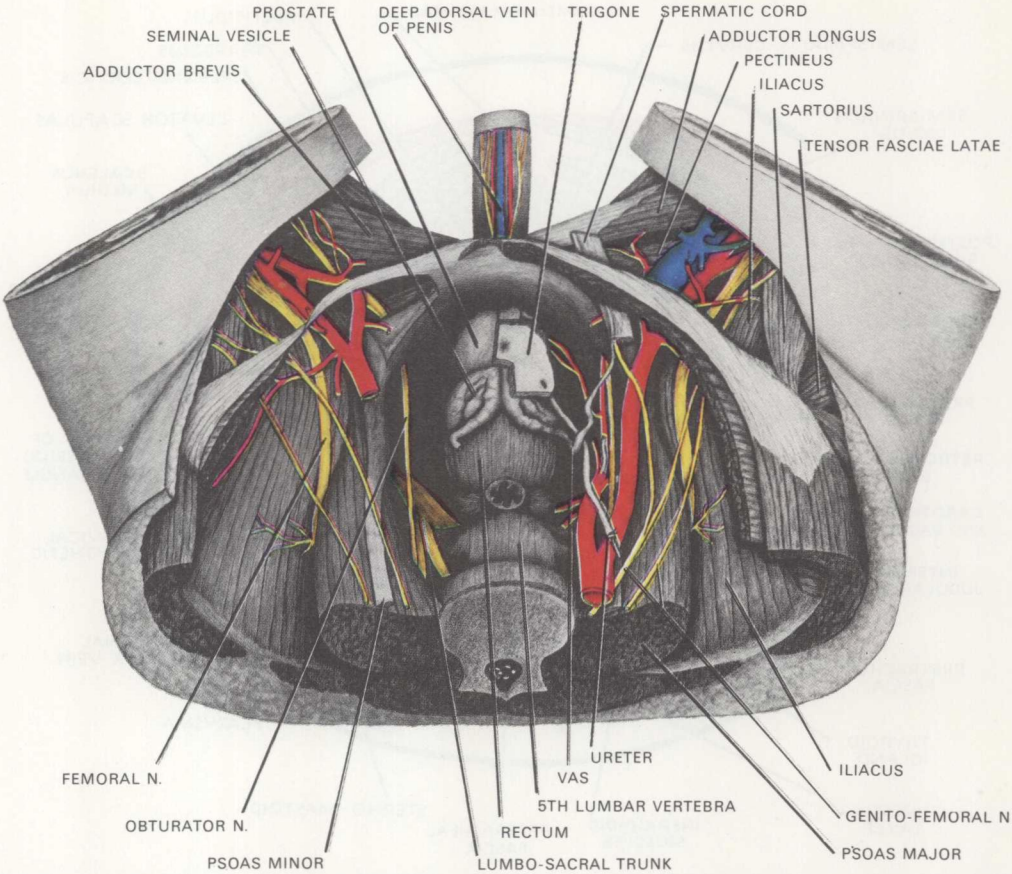


PLATE 21. A DISSECTION OF THE MALE PELVIS, VIEWED FROM ABOVE. Illustration of Specimen S.353 in R.C.S. Museum.

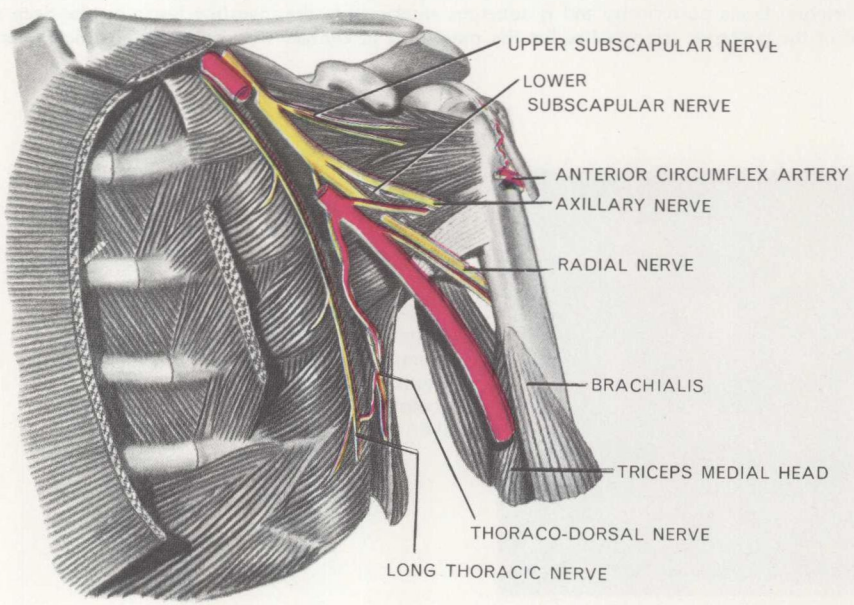


PLATE 22. THE POSTERIOR WALL OF THE LEFT AXILLA, AND THE BRANCHES OF THE POSTERIOR CORD OF THE BRACHIAL PLEXUS.

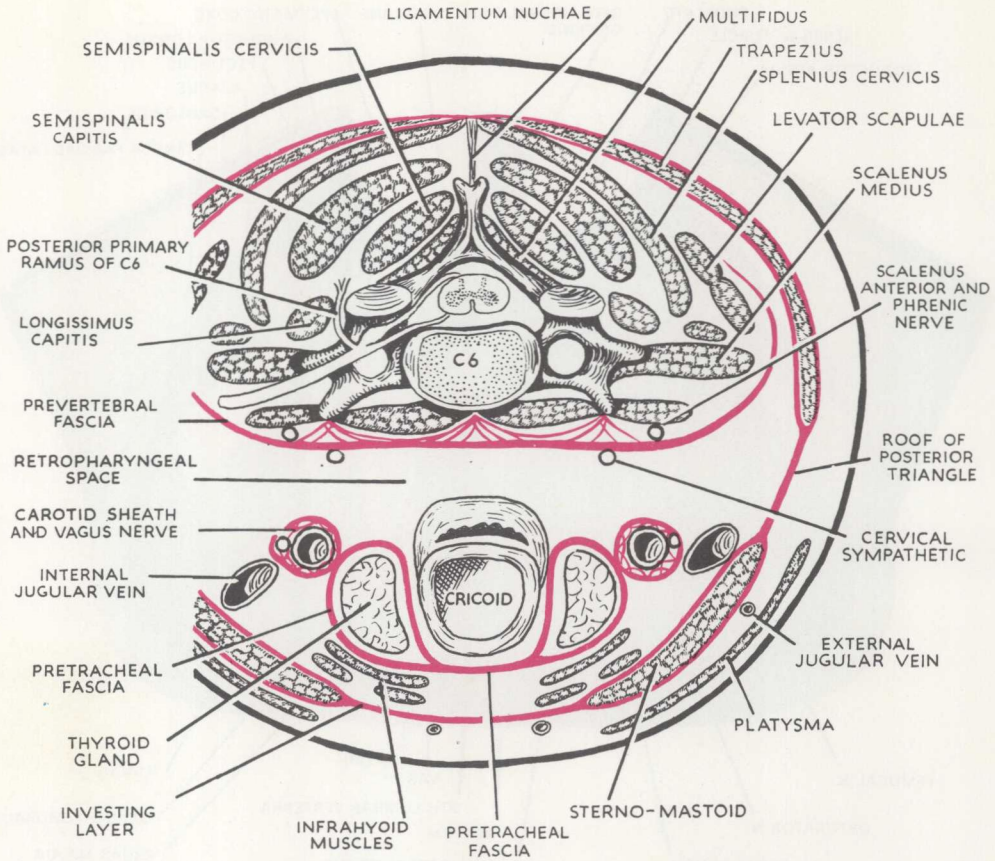


PLATE 23. THE FASCIAL PLANES AND TISSUE SPACES OF THE NECK, IN HORIZONTAL SECTION THROUGH C6. The deep fasciæ and the carotid sheath are shown in red. *The tissue spaces are artificially opened up.* The hypopharynx behind the cricoid actually lies in sliding contact with prevertebral fascia; the retropharyngeal space is only potential. The carotid sheath lies in sliding contact with prevertebral fascia posteriorly, and is adherent anteriorly to the investing fascia on the deep surface of sterno-mastoid. The roof of the posterior triangle lies for the most part in contact with prevertebral fascia over scalenus medius (cf. PLATE 25).

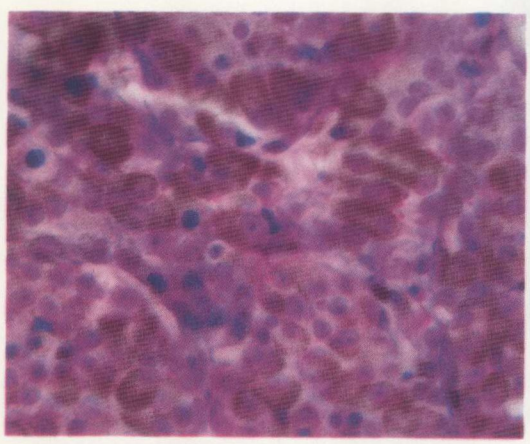


PLATE 24. THE ANTERIOR LOBE OF THE PITUITARY GLAND (HYPOPHYSIS), SHOWING EOSINOPHILS, BASOPHILS AND CHROMOPHOBES. (Photograph, × 400.)